

What is claimed is:

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1. An endoluminal aspiration catheter, comprising:
a guidewire having a proximal end, a distal end, and an expandable
occlusive member mounted on the distal end;
5 an angioplasty catheter having a proximal end, a distal end, a lumen
therebetween, and an expandable dilatation member mounted on the distal end, the lumen
adapted to receive the guidewire; and
an aspiration catheter having a proximal end, a distal end, a first lumen
therebetween adapted to receive the angioplasty catheter, and a second lumen extending
10 and communicating with at least one distal fluid infusion port.
 2. The catheter of claim 1, wherein the expandable occlusive member
is a balloon, and wherein the guidewire further comprises an inflation lumen
communicating with the balloon.
 3. The catheter of claim 1, wherein the expandable dilatation member
15 is a balloon, and wherein the angioplasty catheter further comprises an inflation lumen
communicating with the balloon
 4. The catheter of claim 1, wherein the aspiration catheter comprises
a plurality of distal fluid infusion ports.

5. The catheter of claim 4, wherein the infusion ports are disposed radially about the distal end of the aspiration catheter.

6. The catheter of claim 1, wherein the aspiration catheter further comprises an aspiration lumen extending and communicating with at least one distal aspiration port.

7. The catheter of claim 4, wherein the infusion ports are shaped to direct fluid in a circular path radially and distally beyond the distal end of the aspiration catheter.

8. The catheter of claim 1, wherein the aspiration catheter is free of balloons.

9. The catheter of claim 4, wherein the infusion ports are directed radially outward and angled relative to the radius of the catheter.

10. The catheter of claim 1, wherein the proximal end of the aspiration catheter includes a hemostatic valve.

11. A method for treatment of a vascular lesion, comprising the steps of:

introducing a guidewire into a vessel, the guidewire having an expandable occlusive member mounted on a distal end;

5 advancing the guidewire to a region of interest and positioning the occlusive member downstream of the region of interest;

 advancing an angioplasty catheter over the guidewire and positioning a dilatation member within the region of interest, the dilatation member being mounted on the distal end of the angioplasty catheter;

10 advancing an aspiration catheter over the guidewire and positioning the aspiration catheter proximal the dilatation member;

 expanding the occlusive member;

 expanding the dilatation member within the region of interest; and

15 aspirating fluid and embolic debris from the region of interest while the expanded dilatation member is maintained within the region of interest.

12. The method of claim 11, wherein the step of expanding the dilatation member further comprises the step of deploying a stent within the region of interest.

20 13. The method of claim 11, wherein the aspiration catheter is free of balloons.

14. The method of claim 11, wherein the expandable occlusive member is a balloon, and wherein the guidewire further comprises an inflation lumen communicating with the balloon.

15. The method of claim 11, wherein the expandable dilatation member is a balloon, and wherein the angioplasty catheter further comprises an inflation lumen communicating with the balloon.

16. The method of claim 11, wherein the step of aspirating fluid comprises the steps of:
infusing fluid into the region of interest through a lumen and infusion port of the guidewire; and
suctioning fluid from the region of interest.

17. The method of claim 16, wherein the fluid is suctioned from the region of interest through a separate lumen.

18. The method of claim 16, wherein the fluid is fluoroscopic contrast medium.

19. The method of claim 18, further comprising the step of visualizing the contrast medium under fluoroscopy.

20. The method of claim 11, further comprising the step of monitoring the color of the aspirated fluid to determine completion of the aspiration.

21. A method for treatment of a vascular lesion, comprising the steps

of:

introducing a guidewire into a vessel, the guidewire having an expandable occlusive member mounted on a distal end;

advancing the guidewire to a region of interest and positioning the occlusive member downstream of the region of interest;

advancing a catheter with self-expanding stent over the guidewire and positioning the stent within the region of interest;

advancing an aspiration catheter over the guidewire and positioning the aspiration catheter proximal the stent;

expanding the occlusive member;

expanding the stent within the region of interest; and

aspirating fluid and embolic debris from the region of interest.

22. The method of claim 21, wherein the catheter further comprises a dilatation member mounted on the distal end of the catheter, and wherein the method further comprises the step of aspirating fluid and embolic debris from the region of interest while the expanded dilatation member is maintained within the region of interest.

23. The method of claim 21, wherein the expandable occlusive member is a balloon, and wherein the guidewire further comprises an inflation lumen communicating with the balloon.

24. The method of claim 21, wherein the step of aspirating fluid
5 comprises the steps of:
infusing fluid into the region of interest through a lumen and infusion port of the aspiration catheter; and
suctioning fluid from the region of interest.

25. The method of claim 24, wherein the fluid is fluoroscopic contrast
10 medium.

26. The method of claim 25, further comprising the step of visualizing the contrast medium under fluoroscopy.

27. The method of claim 21, further comprising the step of monitoring the color of the aspirated fluid to determine completion of the aspiration.

28. The method of claim 24, wherein the fluid is infused into the
15 region of interest through infusion ports shaped to direct the fluid in a circular path radially and distally beyond the distal end of the aspiration catheter.

29. The method of claim 21, wherein the step of aspirating fluid comprises the step of infusing fluid into the region of interest through a lumen and infusion port of the guidewire.

5 30. An endoluminal aspiration catheter, comprising:
a guidewire having a proximal end, a distal end, an expandable occlusive member mounted on the distal end, and an irrigation port proximal the expandable occlusive member;

10 an angioplasty catheter having a proximal end, a distal end, a lumen therebetween, and an expandable dilatation member mounted on the distal end, the lumen adapted to receive the guidewire; and

an aspiration catheter having a proximal end, a distal end, a lumen therebetween adapted to receive the angioplasty catheter, and an aspiration port.

15 31. The catheter of claim 30, wherein the expandable occlusive member is a balloon, and wherein the guidewire further comprises an inflation lumen communicating with the balloon.

32. The catheter of claim 30, wherein the expandable dilatation member is a balloon, and wherein the angioplasty catheter further comprises an inflation lumen communicating with the balloon.

33. The catheter of claim 30, wherein the aspiration port communicates with the lumen of the aspiration catheter.

34. The catheter of claim 30, wherein the aspiration catheter is free of balloons.

5 35. The catheter of claim 30, wherein the proximal end of the aspiration catheter includes a hemostatic valve.

36. A method for treatment of a vascular lesion, comprising the steps
of:

introducing a guidewire into a vessel, the guidewire having an expandable
occlusive member mounted on a distal end and an irrigation port proximal the expandable
5 occlusive member;

advancing the guidewire to a region of interest and positioning the
occlusive member downstream of the region of interest;

advancing a therapeutic catheter over the guidewire and positioning the
catheter within the region of interest;

10 advancing an aspiration catheter over the guidewire and positioning the
aspiration catheter proximal the therapeutic catheter;

expanding the occlusive member;

performing an endoluminal procedure within the region of interest;

infusing fluid through the irrigation port; and

15 aspirating fluid and embolic debris through the aspiration catheter.

37. The method of claim 36, wherein the therapeutic catheter is an
angioplasty catheter having a proximal end, a distal end, a lumen therebetween, and an
expandable dilatation member mounted on the distal end, the lumen adapted to receive
20 the guidewire.

38. The method of claim 36, wherein the therapeutic catheter is an atherectomy catheter having a proximal end, a distal end, a lumen therebetween, and an atherectomy assembly mounted on the distal end, the lumen adapted to receive the guidewire.

5 39. The method of claim 36, wherein the therapeutic catheter is a stent deployment catheter having a proximal end, a distal end, a lumen therebetween, and an expandable stent mounted on the distal end, the lumen adapted to receive the guidewire.

40. The method of claim 39, wherein the stent deployment catheter includes a self-expanding stent.

10 41. The method of claim 39, wherein the stent deployment catheter includes a dilatation balloon.

42. A method for treatment of a vascular lesion, comprising the steps
of:

introducing a guidewire into a vessel, the guidewire having an expandable
occlusive member mounted on a distal end;

5 advancing the guidewire to a region of interest and positioning the
occlusive member downstream of the region of interest;

10 advancing an aspiration catheter over the guidewire and positioning the
aspiration catheter proximal the dilatation member, the aspiration catheter having a first
lumen communicating with a first distal port and a second lumen communicating with a
second distal port;

expanding the occlusive member; and

infusing fluid through the first lumen and first distal port and aspirating
fluid and embolic debris through the second lumen and second distal port while the
occlusive member is expanded.

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